

ABSTRACT OF THE DISCLOSURE

A general method is disclosed for using distance sensors to measure the surface profile and twist of objects, even in the presence of rigid-body motions in the measurement directions between the surface and the sensors. The method involves making multiple sequential measurements from a group of sensors while the object moves longitudinally relative to the sensors. The central idea of the invention is the observation that surface height features appear in delayed sequence as the observed surface moves longitudinally relative to the sensor array. However, any rigid-body motions in the measurement directions appear simultaneously at all sensors. Mathematical procedures are used to separate the delayed and simultaneous components of the measurements, from which the surface height profile is determined.

The underlying idea of the present invention is very flexible, and it can easily be adapted to simultaneously measuring the surfaces of two-sided objects. Further possibilities include measurement of surface twist and two-dimensional surface scanning.